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# Unusual Cause of Dyspnea and Chest Pain in Cardiac Patient

**Ayman Helal***

*Faculty of Medicine, Fayoum University, Egypt*

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***Corresponding author:** Ayman Helal, MD, FACC, FSCAI, Faculty of Medicine, Fayoum University, Fayoum, Egypt

**Abstract**

Background: Postoperative dyspnea is common after cardiac surgery that may differ in causes. In common, it may be due to the incision, operation site, cardiopulmonary bypass, and internal thoracic artery harvesting, or lung diseases.

Case summary: Fifty-three years old female presents with dyspnea associated with limiting stitching chest pain 1 year after cardiac surgery. She was diagnosed to have bronchial asthma at this time and she was commenced on inhaled bronchodilators and inhaled steroids without any improvement. Echocardiography showed a good cardiac function, well-functioning prosthetic mitral valve, and a 0.3cm sub-aortic ventricular septal defect with left to right shunt which was insignificant. A respiratory function test demonstrated a restrictive lung disease. According to these results a chest x-ray was requested that revealed the presence of fractured sutures with some parts within the upper part of left side of the chest. A CT chest confirmed these findings and some of the fractured sutures even infiltrating the lung tissue. Fractured migrated sutures are the cause of the stitching chest pain that limit this patient's inspiration.

Discussion: The integration of history taking, echocardiographic findings including shunt quantification, and the result of respiratory function test guide the diagnosis towards a restrictive lung disease which is demonstrated by the chest X-Ray and CT chest to be due to fractured migrated sutures that cause stitching chest pain that limit patient's inspiration.

**Keywords:** Fractured suture; Dyspnea; Stitching chest pain; Post-operative

## Learning Points

a) The importance of integrating history taking, examination, laboratory and radiological investigation to reach a final diagnosis.

b) Fractured sutures are not un-common after cardiac surgeries and should be suspected especially if there is dyspnea with stitching chest pain.

## Introduction

Postoperative dyspnea is common after cardiac surgery, even in low-risk patients. Cardiac surgeons and anesthesiologists are familiar with patients suffering from dyspnea in the early postoperative period, but in some cases, conventional treatment strategies may be ineffective, and a consultation with a pulmonologist may be required. Causes of dyspnea may differ because of the incision, operation site, cardiopulmonary bypass, and internal thoracic artery harvesting, which are unique to cardiac surgery [1] (Table 1).

## Case Presentation

Fifty-three years old female presents with gradual onset progressive course of shortness of breath for the last 5 years (since 2014). The dyspnea was associated with limiting stitching chest pain over the upper part of left side of the chest wall that increase with deep inspiration. The patient is known to be hypertensive for the last 5 years that was controlled on Bisoprolol 5mg/d and Candesartan 4mg/d. She has past medical history of mitral valve replacement in 1996 at which she was commenced on oral anticoagulant (Warfarin 5mg/d with a stable mean INR of 2.5). She underwent another operation in 2013 for removal of a missed sub-aortic membrane and thyroidectomy at the same time!!!. She sake medical advice many times during this period and she was told that she has bronchial asthma and she was commenced on inhaled bronchodilators and inhaled steroids without any improvement.

On examination, her vital signs were (Pulse= 90/min, Blood pressure=130/85mmHg, Respiratory rate=30/min, Temperature=

37°C). General examination revealed normal JVP, normal chest examination (vesicular breathing without any additional sounds) apart from sternotomy and thyroidectomy scars, and normal abdominal examination and normal upper and lower limbs without any edema. Local cardiac examination demonstrated normal prosthetic metallic mitral valve sound with a pan-systolic murmur over A2 area associated with thrill.

**Table 1:** Timeline.

| | |
|---|---|
| **1996** | Mitral valve replacement |
| **2013** | Removal of a missed sub-aortic membrane and myomectomy along with thyroidectomy |
| **2014** | Gradual onset progressive course of dyspnea associated with limiting stitching chest pain over the upper part of left side of the chest wall that increase with deep inspiration |
| **2014-2019** | Diagnosed with bronchial asthma, commenced on inhaled bronchodilators and steroids without any improvement |

Routine investigations were unremarkable (Table 2). ECG was normal (Figure 1). Echocardiography was performed that showed a good cardiac function, well-functioning prosthetic mitral valve (PPG=22mmHg, MPG=9, MVA=1.7cm$^2$), and a 0.3cm sub-aortic ventricular septal defect with left to right shunt (Figure 2, video link: https://www.youtube.com/watch?v=73JbbJrSKdI). The shunt is shown to be in-significant as the calculated Qp/Qs were 1.44 (Figure 3). A respiratory function test (Table 3) was requested that demonstrated a restrictive rather than obstructive lung disease. According to these results a chest x-ray was requested that revealed the presence of fractured sutures with some parts within the upper part of left side of the chest (Figure 4). A CT chest was performed and confirmed the site of fractured wires with some of them inside and outside the chest wall and some of them even infiltrating the lung parenchyma. Fractured migrated sutures are the cause of the stitching chest pain that limit this patient's inspiration (Figure 5).

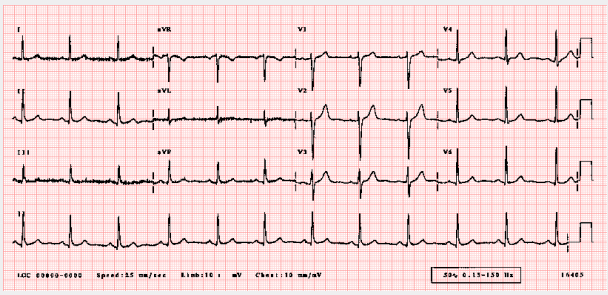

**Figure 1**: Electrocardiogram of the patient.

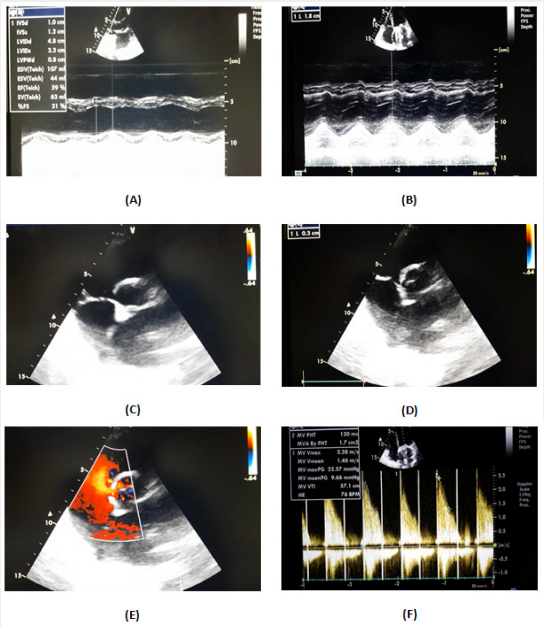


**Figure 2**: Echocardiography of the patient. (A) Normal LV function (B) Normal RV function (C) A short axis view showing the VSD (D) VSD measuring 0.3cm (E) A VSD flow with left to right shunt (F) Prosthetic valve area and gradients


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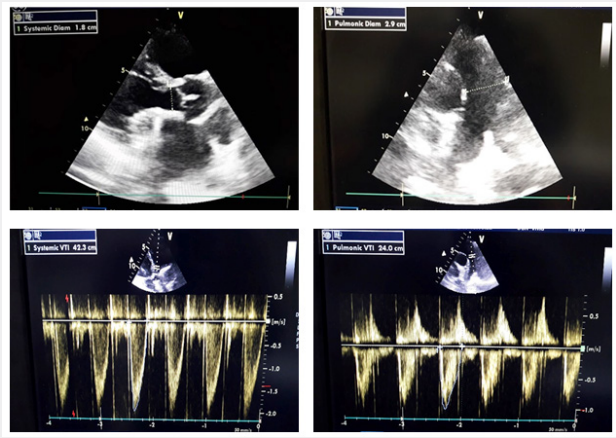

**Figure 3**: Shunt quantification showing insignificant shunt (Qp/Qs=1.44).

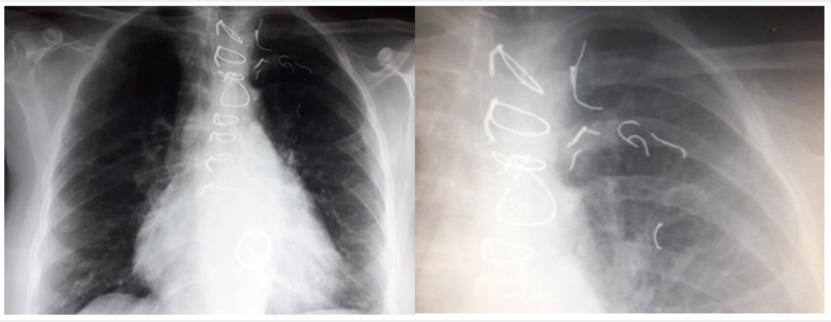

**Figure 4**: Chest X-Ray of the patient.

**Table 2:** Laboratory investigations of the patient.

| | Patient | Unit | Reference Range |
|---|---|---|---|
| **PT** | 32 | s | (10-15) |
| **PC** | 43 | % | (85-100) |
| **INR** | 2.37 | % | (0.9-1.2) |
| **TSH** | 2.5 | uIU/mL | (0.5-5.0) |
| **Free T3** | 2.9 | pg/ml | (2.1-3.8) |
| **Free T4** | 1.4 | ng/dL | (0.8-1.6) |
| **Total Cholesterol** | 202 | mg/dL | (120-200) |
| **Triglyceride** | 161 | mg/dL | (80-150) |
| **HDL** | 52 | mg/dL | (40-80) |
| **LDL** | 118 | mg/dL | (80-120) |
| **FBG** | 88 | mg/dL | (65-110) |
| **Creatinine** | 0.5 | mg/dL | (0.7-1) |
| **HB** | 12.2 | g/dl | (12-18) |
| **TLC** | 5 $X10^3$ | /$mm^3$ | (3.5-10.5) $X10^3$ |
| **PLT** | 232 $X10^3$ | /uL | (150-450) $X10^3$ |
| **Na** | 142 | mmol/L | (135-145) |
| **K** | 4.1 | mmol/L | (3.5-5) |
| **Ca** | 9 | mg/dL | (8.5-10.5) |
| **AST** | 23 | U/L | (6-34) |
| **ALT** | 20 | U/L | (5-21) |
| **cTnI** | 0.002 | ng/mL | <0.01 |

**Table 3:** Respiratory function test of the patient.

| | Unit | Pred. | Pre | %Pred. |
|---|---|---|---|---|
| IVC | I | 2.56 | 0.36 | 14% |
| FVC | I | 2.6 | 0.33 | 13% |
| FEEV1 | I | 2.2 | 0.33 | 15% |
| FEV1/FVC | % | 79 | 99 | 125% |
| FEV1/VC | % | 79 | 92 | 116% |
| PEF | I/s | 5.825.82 | 0.67 | 11% |
| MEF75 | I/s | 5.27 | 0.66 | 13% |
| MEF50 | I/s | 3.63 | 0.57 | 16% |
| MEF25 | I/s | 1.41 | 0.36 | 25% |
| Tex | S | | 2,7 | |



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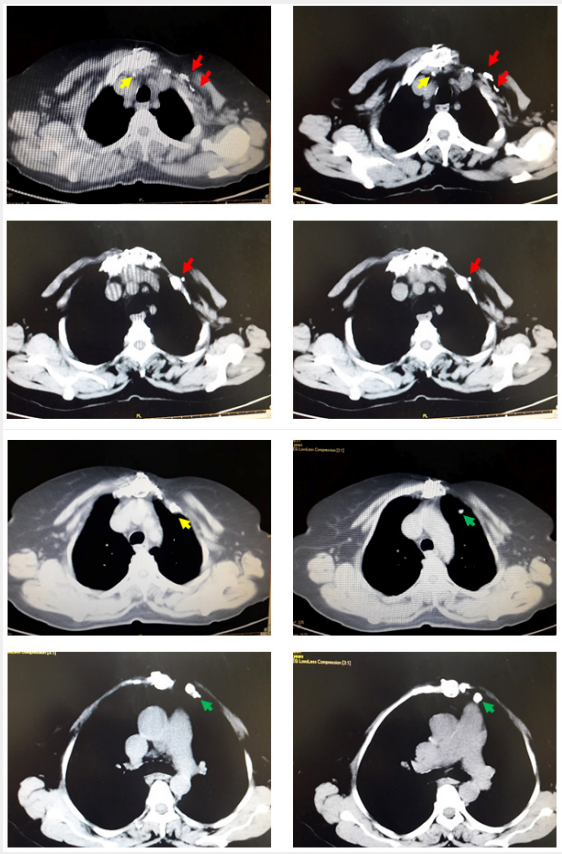

**Figure 5**: CT scan of the chest showing fractured sutures outside (Red arrow) and inside (Yellow arrow) the chest wall and some infiltrating the lung tissue (Green arrow).

## Discussion

This case presents the importance of integrating history taking, examination, laboratory and radiological investigation to reach a final diagnosis. One can say that the residual ASD after sub-aortic membrane removal is the cause of dyspnea and sent the patient to surgery for the 3rd time but the history, shunt quantification, and the result of respiratory function test guide the diagnosis towards a restrictive lung disease which is demonstrated by the chest X-Ray and CT chest. Fractured migrated sutures are the cause of the stitching chest pain that limit patient's inspiration.

Moreover, other one may suspect coronary artery disease as it is a disease with high prevalence worldwide especially in Egypt [2]. Mainly, two reasons respond for the sternal wire fracture: the overloading due to the patient's activity and the wire mechanical fatigue, such as growth of sternum, activities, and the sharp increase of wires' yield strength. Usually, wire fracture occurs a week or more after surgery [3].

## Conclusion

Fractured migrated sutures are the cause of the stitching chest pain that limit patient's inspiration.

## Consent

The author confirms that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

## Author Biography

Prof. Dr. Ayman Helal is a consultant interventional cardiologist who specializes in complex and high-risk coronary interventions. He also has a great experience in cardiac imaging particularly echocardiography. He is lecturer at faculty of medicine, Fayoum University, Egypt and he is the immediate past director of the Egyptian Society of Cardiology "EgSC" cardiovascular research center. He is an active member of the ESC and EAPCI; and a fellow of SCAI and ACC. His main research interest is coronary artery diseases and coronary interventions. He has performed a series of studies in this area and has conducted many clinical trials.

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